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## THE PRACTICE OF COMPETENCY MODELING

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The purpose of this article is to define and explain a trend that has caused a great deal of confusion among HR researchers, practitioners, and consumers of HR-related services: competency modeling. The Job Analysis and Competency Modeling Task Force, a work group jointly sponsored by the Professional Practice Committee and the Scientific Affairs Committee of the Society For Industrial and Organizational Psychology, has recently concluded a 2-year investigation into the antecedents of competency modeling and an examination of the current range of practice. Competency modeling is compared and contrasted to job analysis using a conceptual framework (reflected in a 10-dimension Level of Rigor Scale) that practitioners and researchers may use to guide future work efforts, and which could be used as a basis for developing standards for practice. The strengths and weaknesses of both competency modeling and job analysis are identified and, where appropriate, recommendations are made for leveraging strengths in one camp to shore-up weaknesses in the other.

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After the task force chair, authors are listed alphabetically, left to right.

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The opinions expressed in this article are those of the authors, and do not necessarily reflect the policies of their respective organizations.

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The business environment today is characterized by incredible competition and change (D'Aveni, 1994; Hamel & Prahalad, 1994). In response, organizations are flattening, relying on self-managed teams with greater frequency, becoming highly matrixed, and otherwise reconfiguring the structure of work (Ashkenas, Ulrich, Jick, & Kerr, 1995; Howard, 1995; Keidel, 1994). Accompanying these changes has been a growing concern that traditional job analysis procedures may be unable to continue to play a central role in the new human resource management environment (Barnes-Nelson, 1996; Olian & Rynes, 1991; Sanchez, 1994). It is with this backdrop that the practice of competency modeling has exploded onto the field of human resources over the past several years. Today, surveys of competency-based practice indicate between 75% (Cook & Bernthal, 1998, based on a survey of 292 organizations) and 80% (American Compensation Association, 1996, based on a survey of 426 organizations) of responding companies have some competency-driven applications currently in place.

Given the turbulent practice environment, and the magnitude and pace of the growth of competency modeling, it is not surprising that practitioners and consumers of human resource services alike are looking for some meaningful reference points to guide their work. To aid in this effort, the Society for Industrial and Organizational Psychology (SIOP) commissioned a task force in September 1997 to investigate and review the practice of competency modeling. The members of the SIOP-sponsored Job Analysis and Competency Modeling Task Force (JACMTF)<sup>1</sup> have conducted an extensive literature search, interviewed 37 subject matter experts (SMEs) from varying backgrounds in the development and use of competency models, and have drawn on a rich base of personal experiences to shed light on questions such as:

- What is a competency?
- What is the difference between competency modeling and job analysis?
- Why are competencies so appealing to consumers in business and industry?
- What is the future of competency modeling?

The purpose of this article is to communicate the descriptive findings of the task force, and to offer suggestions for guiding research and improving practice in both competency modeling and job analysis. These suggestions are framed around a conceptualization of evaluative criteria that could eventually serve as a basis for standards for practice.

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<sup>1</sup> Adjunct members of the task force who provided significant input included Tim Athey, Thomas Braun, Steve Doerflein, Richard Lonetto, John Morrison, Earl Nason, Yvette Tazeau, and Robert Tett.

*Literature Searches*

Both computer-based and manual searches of published research and reviews focusing on competencies were conducted. The computer databases of the American Psychological Association, UMI Proquest Direct, Harvard Business Review, and the American Management Association were used to identify articles, dissertations, and book chapters that included analyses or discussions of the concept of competencies. The manual review included examining the proceedings from conferences devoted to competencies or competency modeling, government technical reports, conference presentations, books, consulting publications and materials, and unpublished research and reviews.

*SME Interviews*

The JACMTF identified six potentially distinct perspectives that could be brought to bear on the issues surrounding competencies and, for each group, interviewed five to nine SMEs.

1. Human resource consultants or professionals who either develop competency model systems, or who are knowledgeable consumers, yet have no I-O background or link to SIOP ( $n = 9$ ).
2. Visible thought leaders in the area of competency modeling from either a pro or con perspective ( $n = 6$ ).
3. Former presidents of SIOP ( $n = 5$ ).
4. Industrial and organizational psychology (I-O) types who represent a traditional job analysis perspective ( $n = 5$ ).
5. I-O psychologists who have delivered both traditional job analysis and competency modeling projects ( $n = 6$ ).
6. International consultants who operate outside the United States and work with non-U.S.-based companies ( $n = 6$ ).

These six perspectives formed the basis for a 6-segment sampling plan. In all, 37 interviews were completed using a structured interview format so the SME responses could be meaningfully compared and contrasted. The interviews were conducted by task force members, via telephone, over a 1-month period. Of these 37 SMEs, there were some cases when an individual might have represented or had experience with more than one of the six sampling categories. However, the decision was made to include SME input in one, and only one, category. The questions posed to SMEs included:

- How do you define a competency?
- What types of human resource applications can competencies and competency modeling support?

- What types of human resource applications should competencies and competency modeling not be used to support?
- How is competency modeling different from job analysis?
- Should competency models be validated?
- Why competencies? What is the attraction/value beyond other ways individual differences might be described and characterized?
- Where do you see the future of the competency modeling field headed?

The complete interview protocol, including follow-up question probes, is reproduced in the Appendix.

#### *What Is A Competency?*

To begin with, the word "competencies" today is a term that has no meaning apart from the particular definition with whom one is speaking (Zemke, 1982). Some examples of efforts to define the term from SMEs representing each of the groups in the sampling plan include:

- "The knowledge, skills, and attributes that differentiate high performers from average performers."
- "Competencies are not fundamentally different from traditionally defined KSAOs (i.e., knowledge, skills, abilities, and other characteristics)."
- It is a construct that helps "define level of skill and knowledge."
- "Observable, behavioral capabilities that are important for performing key responsibilities of a role or job."
- "Mishmash of knowledge, skills, and abilities and job performance requirements."
- "I can't."

Some of the more frequently cited definitions from the literature include:

- A mixture of knowledge, skills, abilities, motivation, beliefs, values, and interests (Fleishman, Wetrogen, Uhlman, & Marshall-Mies, 1995).
- A knowledge, skill, ability, or characteristic associated with high performance on a job (Mirabile, 1997).
- A combination of motives, traits, self-concepts, attitudes or values, content knowledge or cognitive behavior skills; any individual characteristic that can be reliably measured or counted and that can be shown to differentiate superior from average performers (Spencer, McClelland, & Spencer, 1994).
- A written description of measurable work habits and personal skills used to achieve work objectives (Green, 1999).

Clearly, there is a wide range of definitions, even among a fairly homogeneous expert population, underscoring the difficulty of pinpointing a standard definition of the term. This lack of consensus shouldn't be too surprising, given the multiple domains in which the terms "competent" or "competency" are prevalent. For example, the extensive use of these terms just in the early psychological literature is evident from the large number of hits (over 1,300) returned from a search for "competency" in the pre1966 PsychInfo databases. In part, these words have their origins in law and, later, in clinical psychology, where the term evolved to define legal standards of mental capacity and awareness, the ability to care for oneself or others, and/or the ability to function in multiple activities of "daily living." Subsequently, the term "competency" was embraced in the vocational counseling profession to define broad areas of knowledge, skills, and abilities linked to specific occupations. The word also has an extensive history in the field of education with an emphasis on broader traditional "knowledge" areas (e.g., mathematics, English). Early industrial psychologists also used the term "competent" to describe successful individuals in specific professions. In all of the above contexts—legal, clinical psychology, vocational, educational, and industrial psychology—the term "competence" defines "successful" performance of a certain task or activity, or "adequate" knowledge of a certain domain of knowledge or skill.

The history of competency modeling practice has followed a similarly circuitous path. Multiple parallel domains contribute to the evolution of the practice of competency modeling, including:

- Individual differences and educational psychology.
- Leadership research and the history of assessment centers.
- Job analysis research.
- The concept of multiple intelligences.
- Prahalad and Hamel's (1990) concept of "core competency."

Each of these foundational building blocks are briefly described below.

*Individual differences and educational psychology.* The study and examination of individual differences is as old as modern civilization. Aiken (1988) cites attempts from the Bible and ancient history to identify and label differences in human behavior and to use those differences for a specific purpose. In the history and systems of psychology, two major approaches characterize the conceptualization of human performance. McLagan (1996) describes these approaches as the differential psychology approach and the educational/behavioral approach. The former focuses on capabilities or characteristics that are relatively enduring and manifested early. In the late 19th and early 20th century, Galton and Cattell pioneered the development of objective techniques to measure human abilities and characteristics. These early efforts focused on

a means to measure intellect and, in particular, focused on identifying specific sensory and psychomotor abilities underlying intellectual functioning. The science of individual differences through the 1950s and beyond quickly expanded to multiple and sometimes overlapping research domains: physical, intellectual, information processing, motivation, personality, values, and more recently, emotional characteristics (see Guilford, 1956; Fleishman & Quaintance, 1984; Rokeach, 1973). Each domain was studied using a wide variety of methodologies and techniques, but all were based (in whole or in part) on inferences from behavioral manifestations. These manifestations were in turn grouped and labeled through judgment or quantitative methodology, or some combination of the two.

Although the differential approach focuses primarily on innate abilities, the primary emphasis from the educational psychology perspective is on performance outcomes and shaping behaviors so that people can be successful. Researchers in this camp have been concerned with creating educational strategies to develop successful performance. Bloom's work (1956, 1967; Krathwohl, Bloom, & Masia, 1964) to create a taxonomy of educational objectives, and Gagné's (1975) efforts to use taxonomies for clarifying objectives for individual development are examples of work in this area. In most cases, the goal is to operationally define the taxonomic categories with illustrative, observable behaviors, which is the same tack taken in most competency modeling approaches.

Of course, the field of industrial and organizational psychology relies heavily on an assumption inherent in both of the approaches described above—namely, that an individual's standing on many of the above-mentioned individual difference dimensions and/or knowledge, skills and abilities (learned, acquired, or enhanced) have the potential to predict job performance or success.

*Leadership research and assessment centers.* The identification and assessment of characteristics underlying successful management performance and leadership behavior has a rich and varied history (Bass, 1990; Bentz, 1963; Laurent, 1961; 1962; 1968; Spreitzer, McCall, & Mahoney, 1997; Taylor, 1960). Within this context, the assessment center approach is one of the many procedures that have been developed to satisfy the interests and requirements of business and industry for selecting managers and leaders (Bray, 1982). According to Thornton and Byham (1982), military assessment programs in World War I and World War II (OSS, 1948), early personality research, and leadership/supervision job analysis research all served as the basis for the development of the management assessment center, which was originated in the AT&T management progress study. The original dimensions were selected based on a

review of the management literature and the judgments of AT&T personnel staff.

An interesting observation that can be made upon reviewing the assessment center literature is the almost controlling influence the original set of dimensions derived from the AT&T research had on the assessment center field; resulting in a curious homogeneity across organizations in the dimension-level taxonomies used to represent job content in different assessment centers (Schippmann, Hughes, & Prien, 1987). The implicit assumption seemed to be that there was a great deal of similarity in management functions across organizations and levels of management. Further, an additional consistency in the assessment center programs, which in part is due to the fact that the taxonomies were homogeneous in the first place, is that the dimension categories are very broad and generic. These dimensions seemed to serve as labels for clusters of "attributes," "characteristics," and "qualities" judged to be critical for job success and resemble what are conventionally called "constructs" (e.g., drive, planning, creativity, flexibility). In many ways, the dimensional structure of assessment centers, and the resulting operational definitions of the broad, generic individual difference dimensions using behavioral statements, was a portent of things to come in the realm of competency modeling.

Consider Finkle's (1976) work to provide a comparison of the assessment dimensions from several early assessment center programs: Bray and Grant (1966), Hinrichs (1969), Thompson (1970), DiCostanzo and Andretta (1970), and McConnell (1969). An assessment dimension like Drive (or Energy), which is common to these five distinct assessment center programs, looks very similar to the competency dimensions found in the generic models of well known providers of competency modeling services like Lominger (Drive for Results; see Lomardo & Eichinger, 1998), Hay-McBer (Persistence; see Spencer & Spencer, 1993), and Personnel Decisions International (Drive for Results; see Davis, Hellervik, Skube, Gebelein, & Sheard, 1996). Common assessment center dimensions like Planning (Bray & Grant, 1966; Hinrichs, 1969; DiCostanzo & Andretta, 1970; McConnell, 1969), creativity/innovation (Bray & Grant, 1966; Thompson, 1970; McConnell, 1969), flexibility (Bray & Grant, 1966; DiCostanzo & Andretta, 1970; McConnell, 1969), and many others, also have parallel dimensions in the competency libraries of Lominger (e.g., Planning, Creativity, and Dealing with Paradox), Hay-McBer (e.g., Systematic Planning, Innovation, and Flexibility), and Personnel Decisions International (e.g., Establish Plans, Innovate, and Demonstrate Adaptability). Though not the major

thrust of their paper, additional information about similarity in competency structures across the generic models used by several major consulting firms may be found in a forthcoming article by Tett, Guterman, Bleier, and Murphy (in press).

*Job analysis.* One way to define job analysis is as a set of procedures designed to identify and describe those aspects of performance that differentiate most sharply between better and poorer workers (Anastasi & Urbina, 1997). This definition is virtually the same language frequently used to define competency modeling. This focus on the critical job requirements that differentiate high from low performers led to the development of the worker-oriented job element method of job analysis (Primoff, 1975; Primoff & Eyde, 1988) that was employed by Primoff and his associates at the U.S. Office of Personnel Management since the mid-1950s. Interestingly enough, one of the specific approaches spurring much of the early interest in competency modeling is the Hay-McBer approach (Spencer et al., 1994), which is essentially an adaptation and extension of the job element method of job analysis.

It should also be noted that, although the task force identified competency modeling work for virtually all major job groups, much of the initial work seemed to have involved management populations. This perspective is supported by recent surveys of competency modeling practices (American Compensation Association, 1996; Cook & Bernthal, 1998). Given this context, job analytic efforts to define the job performance domain of management work become relevant.

The difficulties in precisely defining the job of manager (i.e., real differences in management/supervisor level, long-term cycle of activities, activities rarely repeated or duplicated, organizational and environmental demands change job demands) created a demand for innovative techniques in job analysis. For example, in the 1940s and 1950s, Fleishman (1953) and Flanagan (1954) systematically analyzed supervisor job behavior and identified broad factors or dimensions of performance. Fleishman, and others in the research group at The Ohio State University (Halpin & Winer, 1957), utilized 1,800 statements generated by expert judges and quantitatively reduced these items to two factors: consideration and initiating structure. These two behavioral dispositions served as the basis for the predominant view of supervisory behavior in the management literature as well as two well-known research questionnaires: the Leader Behavior Description Questionnaire and the Leadership Opinion Questionnaire. At about the same time, Flanagan pioneered the classic "critical incident" technique through extensive studies of critical incidents of effective and ineffective performance in Air Force officers. Flanagan identified six broad categories of performance behavior through analysis of critical incidents provided by 3,000 officers.



In the years since, multiple researchers followed with increasingly more sophisticated and complex taxonomies of managerial performance and behavior. Hemphill (1960), Katzell, Barrett, Vann, and Hogan (1968), Tornow and Pinto (1976), Yukl and Lepsinger (1992), Borman and Brush (1993), and numerous others have all made contributions in the past 45 years. Although each contribution is unique, all utilized systematic questionnaires, interviews, observations, and large samples in order to subsequently reduce (usually through quantitative procedures) a large number of descriptor statements to a small number of job performance dimensions or categories. Further, although there is some unique variability in the dimensionality across these studies, what is more striking is the substantial overlap in terms of job performance categories. In other words, although descriptor items or behaviors may be unique, there is a good deal of commonality in the broad dimension labels and organizing structure of the "results."

Along these lines, it should be noted that Boyatzis (1982) extended the work of McClelland (1973; see below) to managerial jobs. He reports a study of 2,000 persons in management jobs from 12 organizations and proposes 21 "characteristics" in his management competency model. Boyatzis used behavioral event interviewing (a variation on the critical incident technique), a picture-story technique and a learning style inventory. Although his methodology and conclusions are controversial and have been criticized (Barrett & Depinet, 1991), his results are not dissimilar with the taxonomic conclusions of many of the job analytic researchers working with management populations.

Furthermore, Tett, Guterman, Bleier, and Murphy (in press) have recently completed an effort to develop a taxonomy of managerial "competencies" derived from earlier models. Using a series of sorting tasks, these authors found that content experts could reliably sort behavioral statements into 47 dimensions; thereby establishing the meaningfulness of the categories and satisfying a critical criterion of taxonomic evaluation (Fleishman & Quaintance, 1984).

*The concept of multiple intelligencies.* In 1973, David McClelland wrote an influential article entitled "Testing for Competence Rather than for Intelligence." His assertions revolved around the theme that traditional intelligence and aptitude tests were not related to important life outcomes. He proposed "competency testing" or "criterion sampling" as a viable replacement. Competencies, according to McClelland, appear to be knowledge, skills, abilities, traits, or motives directly resembling or related to the job or job performance or some other important life outcome.

A program of research conducted by Gardner also stimulated interest in a "competency-like" approach. Gardner used neurological

research with gifted and brain-damaged populations to propose a theory of "multiple intelligences" (e.g., Gardner, 1983; Shapiro, Grossman, & Gardner, 1981), in which intelligence is a dynamic concept involving multiple competencies and opportunities by society to develop these competencies. Like McClelland, Gardner suggested that a wide variety of human cognitive competencies exist and can be examined more effectively if "culturally valued performances are assessed in naturalistic settings" (Hatch & Gardner, 1986).

*Prahalad and Hamel.* The immediate predecessor to, and likely the driver of, the current surge of competency modeling practice involves the field of business strategy and a concept known as "core competencies." As conceived by Prahalad and Hamel (1990), core competencies are not individual-level attributes as much as design components of an organization's competitive strategy. Their work mirrors, at an organizational level, the identification of fundamental (and unique) KSAOs that drive an organization's ability to rapidly change and innovate in response to new and changing markets. Actually their use of the term "competency" is, to some extent, arbitrary and refers primarily to "the collective learning in the organization."

Despite being a distinct concept, the huge popularity of "core competencies" in American business (Prahalad & Hamel's 1990 Harvard Business Review article is the most reprinted paper in the journal's history) likely galvanized much of the interest in individual-level competencies by highlighting the importance of "people-embodied skills" necessary to building core competence. Lawler (1994) expands on these ideas and calls for a nontraditional approach to KSAO identification based on "organizational" analysis and effectiveness rather than job analysis and effectiveness. Lawler does not necessarily call for techniques uniquely different from job analysis. Rather, he calls for an assessment of knowledge, skills, and abilities that would allow an employee to successfully perform any number of tasks and jobs.

Be that as it may, the concept of "core competency" has had an enormous amount of influence on the world of human resources. The natural implications of Prahalad and Hamel's (1990) ideas for human resource management created a natural market for a methodology to identify these "human skills that embody core competencies." This demand, combined with the extensive historical use of the term in multiple, highly visible domains, seems to have brought competency modeling into common, lay use as a generic "fusion" of concepts into a practice for identifying job requirements that is not altogether different from job analysis.

*What Is The Difference Between Competency Modeling And Job Analysis?*

The SIOP task force members posed the question above to the SME group, and the results were intriguing. Although several subject matter experts believed that competency modeling and job analysis are the same, by far the greater number stated that the processes are different. For example, the majority of experts believe that job analysis is much more work- and task-focused and competency modeling is worker-focused. In other words, job analysis may be thought of as primarily looking at "what" is accomplished, and competency modeling focuses more on "how" objectives are met or how work is accomplished. There are a number of other distinctions as well. The question then becomes how best to organize and describe the similarities and differences between the two approaches.

One vantage point from which to make the comparison is with respect to the variables that may affect the results of the job analysis or competency modeling effort. By that we mean the inferential leap from the product of the research, and the effort to utilize the product to guide decisions about the development of a human resources application, is either widened or reduced based on the presence of these variables. As with job analysis, the results of a typical competency modeling effort are seldom viewed as the end product. So, for both competency modeling and job analysis, there is usually some back-end application or set of applications that will be modified or constructed based on these results. Thus, errors in this front-end research cascade down into some unknown amount of error that gets built in to the resulting application. Given this fact, there has been a widespread implied assumption among human resource professionals that the front-end modeling or analysis activities must meet some minimal standards of acceptability so that inferences from the product of the method can be confidently drawn. One way to compare and contrast the "typical" competency modeling effort from the "typical" job analysis effort lies in the level of effort devoted to managing these variables (i.e., the level of rigor of the research methodology). From this perspective, these variables might essentially serve as evaluative criteria. With this goal in mind, the members of the JACMTF identified and defined 10 such variables.

The first variable of this type concerns the method of investigation. In other words, what is the thinking behind the selection of the method (e.g., interviews, focus groups, observation, questionnaires, electronic monitoring, or work diaries) for collecting information? For example, a given method may have the potential for yielding an accurate description of a largely physical job but be incapable of investigating all aspects of a primarily mental job.

The second variable concerns the type of descriptor content collected. That is, what is the rationale for using a descriptor type (e.g., work activities, KSAOs, competencies, work context, performance standards), or particular mix of descriptors? For example, a given type of information may be essential for establishing the content validity of a selection procedure according to the Uniform Guidelines on Employee Selection Procedures (EEOC, 1978) but may be completely unnecessary for conducting job evaluation research.

Third, what are the procedures for developing descriptor content that will form the basis of the work model being created? Is content simply selected from a library of descriptor statements after a brief walk-through and observation of the target jobs? Is it a preexisting and fixed inventory of content selected after researching the literature? Are there extensive interviews and focus groups held to develop a more refined set of descriptor content?...and so forth. A defining characteristic of this variable is the extent to which a meaningful sample of content experts is involved in selecting or developing the descriptors.

Fourth, what is the detail of the descriptor content? Does the final solution consist of simply a handful of broad labels representing categories of content with no associated definitions or are the content categories precisely and unambiguously described using crisply defined sets of homogeneous item-level content descriptors that leave no room for misinterpretation? Furthermore, to what extent are the content categories free from overlap, and to what degree are the item-level descriptors written at the same level of detail (i.e., narrow vs. broad) within and across categories?

Fifth, how closely are the research results linked to business goals and strategies? In other words, to what extent has there been an effort to identify and link to the broader organizational goals and long-term strategies of the organization? For example, a platform of information might be collected to guide the creation of a testing program for a job group, describing the work activities and associated competency requirements as they exist now, without any attempt to factor in the reality that the organization is changing its business strategy. More specifically, a finance company may be promoting a shift from a passive, responsive orientation to sales to a more proactive selling approach with an emphasis on promoting tag-ons.

Sixth, how extensively are the organization's job content experts involved in some form of content review of the resulting categories and subsumed item-level descriptors? That is, subsequent to the creation of the rationally derived taxonomy, who and how many people provide input and feedback on descriptor content meaning, practicality, and overall relevance for the target research population?

Seventh, to what extent is there effort to provide a ranking of descriptor content? For example, is the solution an unprioritized set of narrative content describing the target job group, or is there some form of rational or empirical procedure used to prioritize the categories and items in terms of importance for job success, frequency of occurrence, difficulty to learn, or some other scale?

Eighth, to what extent is there an effort to assess the consistency or reproducibility of the resulting solution or of the judgments that resulted in the creation of the final descriptor set? Reliability here can be in terms of the classification of item-level descriptors or behaviors into broader categories or dimensions, or in terms of the ranking of items and/or dimensions according to some scale (e.g., importance, frequency, difficulty).

Ninth, to what extent are there clear and logical criteria for including or excluding some items and broader content categories from the final descriptive set (i.e., solution or model)? In other words, from the universe of potentially useful descriptors for a target job, are there rationally developed and consistently employed criteria for retaining or deleting content in order to create a more rarefied final set? These criteria might be some minimal level of agreement among SMEs about the behaviors that relate to successful performance, a basic level of importance or frequency, a measure of linkage to business strategy, some form of retranslation to determine clarity, or other factors.

Tenth, to what extent is there effort to provide documentation for the research approach, methods used, experts involved, and results obtained? Clearly, this is not quite the same type of evaluative criterion as the previous nine, in that variability along this dimension does not necessarily affect the quality of the inferences made from the product of the research. However, because it is so important for establishing the long-term credibility of the research and because it is an area with relatively wide discrepancies between the different approaches, it was judged worthwhile to include here as an evaluative criterion.

In summary, the 10 evaluative criteria noted above represent a work product designed to make explicit recommendations for practice. The chart presented in Table 1 is an effort to operationally define the range of potential practice for each of the 10 evaluative criteria and to elaborate on the definitions provided above. During the 12 months this scale was under development, the members of the JACMTF took special care to ensure the definitions and examples in each cell adequately represented the purported criterion being defined.

Taken together, these evaluative criteria may be considered a measurement yardstick for comparing different approaches for gathering information about a position, job, job group/family, role, collection of

TABLE 1  
*Level Of Rigor Scale*

Variable	1 Low rigor	2 Low/Medium rigor	3 Medium rigor	4 Medium/High rigor	5 High rigor
1. Method of investigation	The same method for collecting information (e.g., focus groups, observation, interviews, or fixed-content questionnaire) is employed, regardless of setting or target population.	Same two methods used every time regardless of the research setting and intended application.	Variable combination of two methods used, depending on some effort to consider the constraints of the research setting.	Variable combination of two or three methods used, depending on the research setting, target population, and intended application.	A variable combination and logically selected mix of multiple methods are used to obtain information (e.g., interviews, focus groups, observation, questionnaires), depending on the research setting, target population, and intended application.
2. Type of descriptor content collected	Same type of information (e.g., competencies, work activities, KSAOs, or performance standards) collected every time, regardless of intended application(s).	Same two types of information collected every time, regardless of intended application(s).	Variable combination of two types of information collected, depending on the intended application(s).	Variable combination of two or three types of information (e.g., competencies, work activities, KSAOs, and performance standards) collected, depending on the intended application(s).	Variable combination of multiple types of information collected, depending on intended application(s).

TABLE 1 (continued)

	1	2	3	4	5
Variable	Low rigor	Low/Medium rigor	Medium rigor	Medium/High rigor	High rigor
3. Procedures for developing descriptor content	No effort to gather information from content experts; instead, the researcher or analyst serves as sole content expert.	Information is gathered from convenient samples of content experts using ad hoc or unstructured procedures. No qualification criteria (e.g., time on the job, top performers based on appraisals) are used to identify individuals in the best position to serve as content experts.	Information is collected from a large number of content experts using a semi-structured protocol. Some effort is made to identify individuals most qualified to serve as content experts.	Information collected from content experts using a structured protocol and with reference to a fairly well thought out sampling plan. Content experts meet some qualification criteria (e.g., time on job, top performers based on appraisals).	Information collected from content experts using a structured protocol and following a logically developed sampling plan with a comprehensive and representative sample. Content experts meet some qualification criteria (e.g., time on job, top performers based on appraisals).
4. Detail of descriptor content	Handful of broad labels representing categories of content, with no associated definitions.	Broad labels with narrative definitions or a small sample of descriptor items serving as the operational definition.	Moderately specific labels representing different categories of content and a mix of descriptor items helping to operationally define each category.	Fairly precise labels representing different categories of content that subsume fairly comprehensive sets of item-level descriptors which operationally define each category.	A number of precise labels representing discrete categories of content that subsume very comprehensive and crisply defined sets of item-level descriptors which operationally define each category and leave no room for misinterpretation.

TABLE 1 (continued)

Variable	1	2	3	4	5
	Low rigor	Low/Medium rigor	Medium rigor	Medium/High rigor	High rigor
5. Link to business goals and strategies	No attempt to understand business context or broader goals and long-term strategies of the organization.	Minimal effort to research the business context and review strategy-related documents to ensure results are aligned with the broader goals and long-term strategies of the organization.	Modest effort to research the business context and review strategy-related documents to ensure results are aligned with the broader goals and long-term strategies of the organization.	Substantial effort to research the business context and review strategy-related documents, as well as meetings with HR and/or line managers who are aware of the organization's plans, in an effort to ensure the results are aligned with the broader goals and long-term strategies of the organization.	Significant effort to research the business context and review strategy-related documents, as well as meetings with top executives responsible for setting strategies, to ensure the results are aligned with the broader goals and long-term strategies of the organization.
6. Content review	No content review.	Brief review of rationally created solution with the client sponsor to ensure: ●Item-level descriptors are clear.	Formal review of rationally created solution by client project leaders to ensure: ●Item-level descriptors are clear. ●Content categories do not overlap.	Formal review of rationally created solution by client project leaders and a technical review team to ensure: ●Item-level descriptors are clear. ●Content categories do not overlap. ●Content categories are parsimonious and internally consistent.	Formal review of rationally created solution by client project leaders, technical review team, and potential end users of the application built from the solution to ensure: ●Item-level descriptors are clear. ●Content categories do not overlap. ●Content categories are parsimonious and internally consistent. ●Items and categories represent measurable content appropriate for the intended application.



TABLE 1 (continued)

Variable	1	2	3	4	5
	Low rigor	Low/Medium rigor	Medium rigor	Medium/High rigor	High rigor
7. Ranking descriptor content	None. The final descriptor set is an unprioritized set of narrative content describing the target job group.	Based on participation in interviews, focus groups, etc., the researcher or analyst serves as expert and rationally creates an ordinal prioritized descriptor set of broad labels.	Based on some procedure for weighting the judgments of a small group of content experts (e.g., limited distribution questionnaire), an interval prioritization of the final descriptor set is derived.	Some mix of questionnaire, electronic monitoring, observation, diary data recording, or other methods are used with a fairly large sample of content experts to collect data that is empirically used to create an interval prioritization of the detailed descriptor set.	Some mix of questionnaire, electronic monitoring, observation, diary data recording, or other methods are used with a comprehensive and representative sample of content experts to collect data that is used to empirically create an interval prioritization of the detailed descriptor set.
8. Assessment of reliability	No effort to assess consistency or reproducibility of the results.	Based upon discussions with a convenient/casual sample of content experts, the analyst concludes that there is general agreement among the expertise regarding the meaningfulness and relevance of the categories of content.	A convenient/casual sample of content experts perform some rating task (e.g., rating items on relative importance for successful job performance). Results are expressed in terms of the average intercorrelation of the ratings.	A systematic sample of content experts are involved in matching content category labels with definitions and perform some rating task (e.g., rating items on relative importance for successful job performance). Results are expressed in terms of percent correct matches and the average intercorrelations of the items.	Multiple systematic samples of content experts are involved in matching content category labels with definitions and item-level descriptors and perform some formally structured rating task (e.g., rating items on relative importance for successful job performance). Results are expressed in terms of percent of correct matches and the average intercorrelations of the ratings.

TABLE 1 (continued)

Variable	1	2	3	4	5
	Low rigor	Low/Medium rigor	Medium rigor	Medium/High rigor	High rigor
9. Item/ category retention criteria	None. All created items/categories retained.	A single criterion is applied to items and categories to determine retention or deletion, though the criterion is somewhat unclear or inconsistently applied.	A single clear, logical criterion is consistently applied to items and categories to determine whether content is retained or deleted.	Two clear, logical criteria are consistently applied to items and categories to determine whether content is retained or deleted.	Multiple clear, logical criteria are consistently applied to items and categories to determine whether content is retained or deleted.
10. Docu- mentation	None.	Brief handwritten notes.	Summary file memo referencing related user materials and outputs.	Standardized final report "shell" document with appropriate information and data slotted in.	Detailed and customized written report which thoroughly describes the procedures employed and the composition of content expert samples, includes copies of instruments used, and comprehensively reports the results.

titles in a value chain, and so forth. In the current initiative, the intent was to provide a comparison between competency modeling and job analysis. Using (a) the results of the literature review, (b) the write-ups from the 37 SME interviews, and (c) the numerous discussions among task force members concerning the hundreds of job analysis and competency modeling studies the authors have reviewed over the years as the information base, 11 members of the JACMTF completed a rating task using the level of rigor scale applied to both competency modeling and job analysis.

To elaborate, prior to conducting ratings, the literature review was used to uncover important source documents, which were then copied and distributed to task force members. The import and implications of these documents were then discussed and debated over numerous conference calls over a 2-year time frame. The sum of these written documents and the associated discussions represent one source of stimulus material used by the task force members in making their judgments. In addition, the results of the literature review were used to identify potential content experts to include in the SME interviews.

The SME interviews constituted a second leg of the information base used by the JACMTF raters. The juxtaposition of responses from the six perspectives represented in the interview protocol were consolidated into a single document so task force members could meaningfully compare and contrast the different perspectives. This presentation of the SME interview results proved to be particularly valuable and was made available to task force members prior to making their ratings. A slightly modified version of this document, which disguises the identity of who said what (SMEs were guaranteed anonymity to ensure that their frank responses did not come back to haunt them in their current organizations or in efforts to consult with clients), is available from the task force chair.

Finally, the members of the JACMTF themselves represented a wealth of experience in both competency modeling and job analysis. The more personal experiences and projects were shared openly among the members of the task force, and the observations of what we were running into in the field, what had (or had not) worked in our own research, and so forth, were frequently discussed over the course of 2 years of conference calls. These discussions served as a third source of shared information and context from which raters provided judgments.

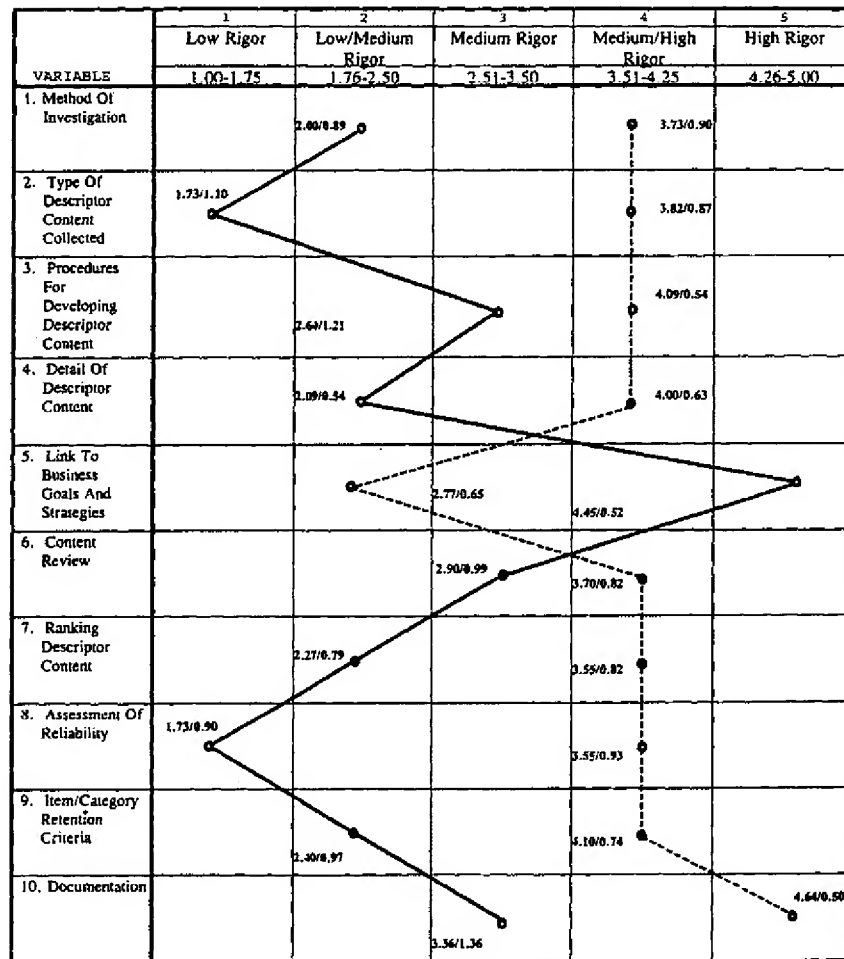
Based on everything we had learned, instructions to task force members were to make their judgments with reference to the typical or modal level of practice on each of the 10 criteria for both approaches. Means, standard deviations, and correlations between the 10 criterion variables appear in Table 2. Figure 1 provides a graphic representation by juxta-

TABLE 2  
*Evaluative Criteria: Descriptive Statistics and Correlations*

Variables	M	SD	Competency modeling									
			1	2	3	4	5	6	7	8	9	10
Competency modeling												
1. Method of investigation	2.00	.89										
2. Type of descriptor	1.73	1.10	63									
3. Procedures for developing	2.64	1.21	19	22								
4. Detail of descriptor	2.09	.54	21	32	82							
5. Link to business	4.45	.52	21	-17	29	19						
6. Content review	2.90	.99	00	-21	60	61	52					
7. Ranking descriptor	2.27	.79	00	26	64	64	-33	31				
8. Assessment of reliability	1.73	.90	49	75	18	06	-13	-39	26			
9. Retention criteria	2.40	.97	12	57	57	32	-13	05	53	75		
10. Documentation	3.36	1.36	49	57	64	50	31	27	55	58	63	
Job analysis												
1. Method of investigation	3.73	.90	00									
2. Type of descriptor	3.82	.87	-13	-03								
3. Procedures for developing	4.09	.54	-41	-42	21							
4. Detail of descriptor	4.00	.63	-18	-25	13	00						
5. Link to business	2.27	.65	-36	-30	27	50	-11					
6. Content review	3.70	.82	-71	-53	23	07	31	23				
7. Ranking descriptor	3.55	.82	-55	-48	-59	-58	-40	-45	-10			
8. Assessment of reliability	3.55	.93	00	09	-61	-51	-56	-63	-09	31		
9. Retention criteria	4.10	.74	-32	-08	-32	-29	-12	-29	-05	37	25	
10. Documentation	4.64	.50	22	36	42	50	31	13	28	20	13	36

TABLE 2 (continued)

Variables	M	SD	Job analysis								
			1	2	3	4	5	6	7	8	9
Job analysis											
1. Method of investigation	3.73	.90									
2. Type of descriptor	3.82	.87	82								
3. Procedures for developing	4.09	.54	67	46							
4. Detail of descriptor	4.00	.63	70	54	88						
5. Link to business	2.27	.65	-03	-08	-09	-25					
6. Content review	3.70	.82	31	57	51	31	18				
7. Ranking descriptor	3.55	.82	22	29	10	00	26	29			
8. Assessment of reliability	3.55	.93	19	26	-11	00	-11	-17	75		
9. Retention criteria	4.10	.74	43	71	-07	-03	16	42	79	69	
10. Documentation	4.64	.50	20	29	-23	00	03	21	-20	04	12



\*Means/standard deviations are reproduced next to plotted points in the figure.

———— = "Typical" competency modeling project

- - - - - = "Typical" multimethod job analysis project

**Figure 1: Comparison of "Typical" Competency Modeling Rigor Profile Versus "Typical" Job Analysis Approach\***

posing the snakeplot of means for both competency modeling and job analysis.

Of course, the snakeplot profiles presented in Figure 1 in no way represent "the truth." A single point on this scale cannot capture the range of activities that occur along the practice continuum, in both the competency modeling and job analysis camps, associated with each evaluative criterion. In short, neither job analysis nor competency modeling are singular approaches to studying work. Furthermore, competency modeling practice in particular is a quickly evolving approach. What might be considered typical practice today may well be different 5 years from now. Nevertheless, with these cautions against over-interpretation in mind, the JACMTF does believe the data in Table 2 and the juxtaposed snakeplots in Figure 1 reasonably illustrate the preponderance of practice in these two approaches to capturing information about jobs and the associated person requirements *at this point in time*.

As Figure 1 indicates, job analysis approaches are, in general, likely to be more rigorous in managing and controlling the variables that can impact the quality of the resulting information than competency modeling approaches. The most pronounced areas of distinction include variable 2, the type of descriptor content collected, and variable 8, assessment of reliability. In the first case, competency modeling projects are much more likely to use the same type of input content (i.e., competencies) every time, regardless of the research setting and intended application(s) to be constructed, whereas job analysis approaches are more likely to use variable combinations of two or three types of input content (e.g., tasks and/or KSAs or competencies and/or performance standards) depending on the unique demands of the research context and the intended application(s). In the second case, the majority of competency modeling efforts are unlikely to include any effort to evaluate the consistency or reproducibility of the results.

The one area where the typical competency modeling approach is likely to demonstrate more rigor than its job analytic counterpart is with reference to variable 5, establishing a link to business goals and strategies. Competency approaches typically include a fairly substantial effort to understand an organization's business context and competitive strategy and to establish some direct line-of-sight between individual competency requirements and the broader goals of the organization. On the other hand, examples of job analysis methods endeavoring to make this connection are few and far between.

It should be noted that the area of most disagreement among the JACMTF raters involved variable 10, which concerns the level of documentation in competency modeling ( $SD = 1.36$ ). The ratings ranged from 1 to 5 on the 5-point scale and reflect the two distinct points of

view among the task force members. On one side were those who felt our input data indicated that the typical competency approach yielded minimal, if any, formal documentation of methods and results. Conversely, there was a contingent from the task force that viewed competency approaches as often producing the kind of comprehensive and thorough reports that clearly characterize job analysis methods ( $\bar{X} = 4.64$ ;  $SD = .50$ ). Although only conjecture, it may well be that this lack of agreement reflects the degree of flux in the practice of competency modeling. Several years ago, the typical back-end of a competency modeling project probably did result in minimal documentation, although today the level of reporting is less distinguishable from job analysis approaches. In part, this perceived trend may be a result of more I-O psychologists conducting work in the domain of competency modeling; documenting the development of their models in a manner similar to which they have grown accustomed when doing job analysis research.

The JACMTF raters demonstrated a similar lack of agreement in the ratings of variable 3, the procedures for developing descriptor content. Again, the lack of agreement probably reflects, at least in part, the evolution of practice in competency modeling. Several years ago it was fairly common to see competency models developed solely based on a "modeling expert" rummaging through the organization for a day or two and then simply selecting competency dimensions from an existing competency library. Our sense is that, more and more, researchers working under the rubric of competency modeling are likely to collect information from an organization's own content experts, follow some form of logical sampling plan, and use some type of structured protocol.

#### *Why Are Competencies So Appealing To Consumers?*

The above comparison of competency modeling and job analysis, although informative, tells only part of the story. There are other points of comparison that could be made between competency modeling and job analysis. Examining some of these "other" variables, in addition to further defining the competency modeling approach, may provide some insight into the market appeal of competency methods.

The first of these additional, nonevaluative variables concerns the extent to which there is a focus on core competencies. For example, to what degree do the different approaches (i.e., competency modeling versus job analysis) endeavor to identify and describe what is similar across jobs, business segments, functional areas, job levels, and so forth? Second, to what extent is there an effort to identify and document the functional knowledge or technical skills associated with a job? Third, is there an attempt to identify those areas of content that are related



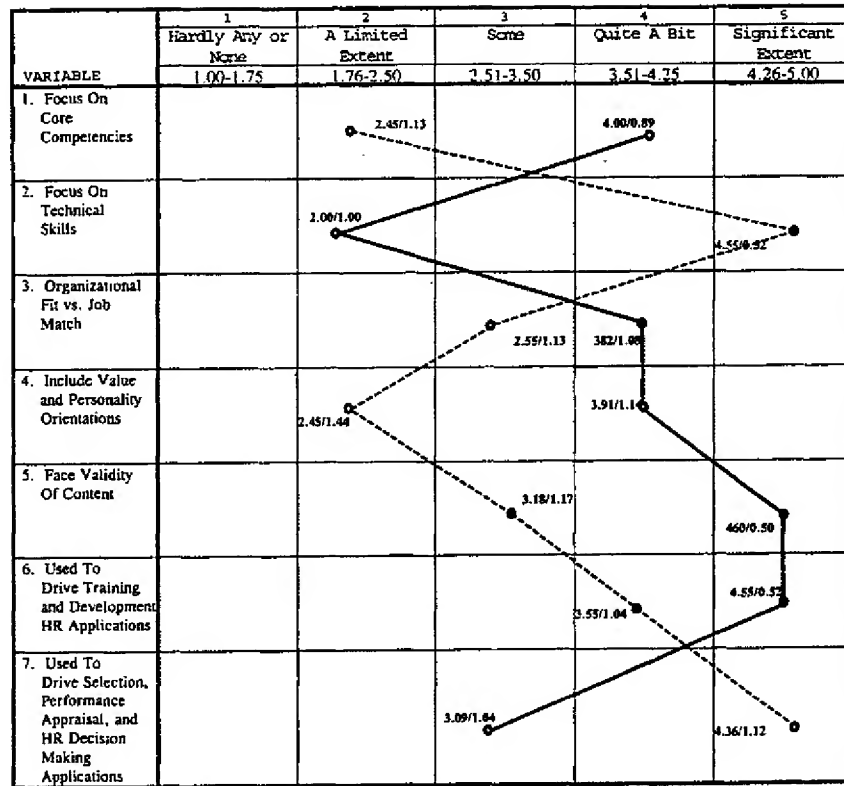
to long-term organizational fit versus short-term job match? Fourth, to what extent is there an attempt to include personal value and personality orientations in the mix of descriptor content defining a job, work role, job group, or whatever? Fifth, to what extent are the category labels and subsumed descriptor content face valid and written in the language of the client organization? Sixth, to what extent is the approach used to drive training and development applications? Seventh, to what extent is the approach used to drive selection, performance appraisal, and other human resource decision making applications?

As with the evaluative criteria discussed in the previous section, the above seven variables may be used to compare and contrast the "typical" competency modeling and job analysis approaches. Similar to the procedures described previously, 11 members of the JACMTF rated both competency modeling and job analysis with reference to the seven "other" variables described above. However, in this case, the seven variables were rated using a scale anchored by "expressions of amount" (e.g., 5 = *a significant extent*, 4 = *quite a bit*, 3 = *some*, 2 = *a limited extent*, 1 = *hardly any or none*). Thus, the rating task involved making a judgment about the extent to which each of these seven additional variables characterized the typical competency and the typical job analysis approaches; again, the (a) literature review, (b) SME interviews, and (c) collective experiences of task force members were used as the basis for the judgments. Means, standard deviations, and correlations between the seven additional variables appear in Table 3. Figure 2 graphically presents a portion of the results by juxtaposing the snakeplot of means for both competency modeling and job analysis.

As Figure 2 illustrates, there are a number of pronounced differences between competency modeling and job analysis, though none may be more telling than the first. Competency modeling approaches typically provide descriptions of the individual-level competencies that are core, or common, for an occupational group, entire level of jobs (e.g., executive, management, supervisory, hourly), or for the organization as a whole. The focus is on broad applicability and leveraging what is in common or universal. Even when the modeling effort targets a narrowly defined job group (e.g., sales managers), the resulting descriptions are typically at a fairly high level and general in nature. The focus for job analysis, on the other hand, is typically description at a level that emphasizes what is distinct or different across jobs, occupational groups, levels in the organization, and so forth. Although job analysis can at times take a broad focus (e.g., when conducting job family research), the descriptor items serving as a basis for the grouping typically represent a level of granularity that is far more detailed than is achieved by most competency modeling efforts.

TABLE 3  
*"Other" Variables: Descriptive Statistics and Correlations*

Variables	M	SD	Competency modeling							Job analysis					
			1	2	3	4	5	6	7	1	2	3	4	5	6
Competency modeling															
1. Core competencies	4.00	.89													
2. Technical skills	2.00	1.00	-.34												
3. Fit versus job match	3.82	1.08	.31	-.56											
4. Value & personality orientation	3.91	1.14	.49	-.44	.31										
5. Face validity of content	4.64	.50	.00	.40	.05	-.06									
6. Training & dev. applications	4.55	.52	.43	-.19	.02	.43	.45								
7. Selection & decision applications	3.09	1.04	.11	.29	-.16	.01	-.31	-.10							
Job analysis															
1. Core competencies	2.45	1.13	-.40												
2. Technical skills	4.55	.52	.43	.00						-.63					
3. Fit versus job match	2.55	1.13	.79	-.27	.17					-.45	.29				
4. Value & personality orientation	2.45	1.44	.23	.00	.19	-.34				-.02	.04	.20			
5. Face validity of content	3.18	1.17	.10	-.09	-.05	-.44	-.22			-.07	-.34	.37	.60		
6. Training & dev. applications	3.55	1.04	.11	.19	.01	-.12	.42	.13		-.40	.32	.40	.49	.49	
7. Selection & decision applications	4.36	1.12	-.50	.09	-.44	.11	-.10	.31	-.12	.17	-.20	-.41	-.79	-.27	-.45



\*Means/standard deviations are reproduced next to plotted points in the figure.

———— = "Typical" competency modeling project

- - - - - = "Typical" multimethod job analysis project

**Figure 2: Comparison of "Typical" Competency Modeling and "Typical" Job Analysis Approaches on Seven "Other" Variables**

Clearly, the emphasis on core competencies has been an important selling point for competency modeling. On the downside, models built using only general competencies tend to look alike, despite being developed for different jobs, functions, or organizations. The flip side of the coin is whether an approach tends to include technical skills in the resulting description of a job, job group, role, or whatever. As variable 2 (focus on technical skills) indicates, this is often part of the focus for job analysis approaches, but less so for competency modeling.

Further, competency modeling approaches are more likely to emphasize long-term organizational fit versus shorter-term job match content in the resulting descriptions. This emphasis is likely a natural consequence of the effort to incorporate an organization's vision and core values in part of the modeling process as described under the fifth evaluative criterion in the previous section. Similarly, value and personality orientations are more likely to be built into the models that are produced.

The face validity of the content, variable 5, is another differentiator between the two approaches. More so than job analysis approaches, the typical competency modeling project is likely to include various review sessions and focus groups to ensure the descriptive content captures the language and spirit that is important to the client organization. As a result, the consumers "see themselves" in the resulting descriptions, an outcome that many job analysis approaches don't come close to emulating. This is not a small distinction when looking for reasons to explain the surge of popularity in competency modeling.

Finally, though there is some disagreement among the JACMTF raters as indicated by the magnitude of the standard deviations, it appears as though competency modeling approaches are slightly more likely to serve as a platform for training and development applications, and for job analysis approaches to be more likely to serve as a basis for creating selection, performance appraisal, and other human resource decision making applications. More than anything, this distinction is probably driven by the recognition that the level of rigor and documentation found in many competency modeling efforts would have difficulty withstanding the close scrutiny of a legal challenge.

#### *What Is The Future Of Competency Modeling?*

As part of the SME interview process, individuals were asked to describe the future of competency modeling. They provided a range of answers with no clear theme emerging. Some see an increasing number of organizations using the approach. This excites one group of SMEs who see possibilities for improved practice, but it concerns another group of

SMEs who worry about a diluted emphasis on methodology and rigor in model development. Representatives from both camps believe that the work will be more technologically driven with improved software applications (e.g., expert systems that help develop models). Though by no means a majority, a few participants see absolutely no value in competency modeling and expect it to die quickly.

One thing we can say for certain is, as with other management trends that have influenced the human resources field in recent times (e.g., work teams, total quality management, reengineering), the field of I-O psychology has not led the competency modeling movement, despite the fact that defining the key attributes needed for organizational success is a "core competency" of I-O psychology. Rather than helping to steer the course for practice, applied psychologists have been merely riding the wake of yet another trend.

Where do we go from here? At the minimum, our hope is that this article helps explain and define a significant trend—competency modeling—that many in the I-O field have had trouble conceptualizing and understanding. In an effort to facilitate understanding, we have chosen to compare competency modeling to something somewhat similar in nature that most I-O psychologists understand quite well: job analysis.

However, our intent is to not simply stop at this point. Although the stated charter of the task force did not include developing detailed prescriptive guidelines for practice, we do believe the level of rigor scale that was developed as a basis of comparison for the competency and job analysis approaches could be extended and used as a structure for establishing guidelines. The appropriate interpretation of the results from a front-end information gathering methodology, such as competency modeling or job analysis, depends on a number of assumptions. The extent to which these assumptions are considered and controlled will influence the degree of trust one has in the results. Of course, the minimum level of rigor required for each of the 10 evaluative variables listed in Table 1 has not been established as part of the work of this task force. This could be a logical next step in an effort to make more concrete the standards for practice that do exist in documents like the Uniform Guidelines on Employee Selection Procedures (EEOC, 1978), Principles for the Validation and Use of Selection Procedures (SIOP, 1987), and the Standards for Educational and Psychological Testing (AERA, APA, & CME, 1999).

However, it should be pointed out that the minimum levels of rigor required in each of the 10 evaluative criteria may be different in different situations. In other words, there is an array of contextual and practical variables that can impact decisions about the level of rigor that is most appropriate in a given situation. For example, "impact" variables like the:

- Purpose or target application(s) of the research (e.g., job evaluation, selection, job classification);
- Extent to which the target application is expected to be free from legal or union review;
- Number of specific job titles (and incumbents) included in the scope of the proposed application;
- Extent to which there are planned changes in the organization that will likely affect the work process or performance requirements of targeted jobs; and,
- Extent to which the results of work in the targeted jobs are observable and/or dynamic;

can greatly influence the level of rigor required in evaluative criterion variables like the:

- Appropriate method of investigation;
- Type of descriptor content collected;
- Procedures for developing descriptor content;
- Detail of descriptor content; and the,
- Linkage to business goals and strategies.

So, rather than overly general "minimum level of rigor" recommendations, what is required at this point is research that investigates the profiles of influence different impact variables have (or should have) on the level of rigor requirements for different evaluative criteria. Schippmann (1999) provides a list of impact variables and a description of initial research resulting in situation assessment profiles for different HR applications.

In addition, our hope is that this article will serve as a wake-up call for researchers conducting job analysis work (both applied and basic). In an era of unprecedented change in business and the way work is structured, when organizational leaders eagerly seek useful information they can use to drive decision making, it is fascinating that a powerful tool like job analysis is widely viewed as a mundane technical activity (Prien, 1977) that is merely part of the critical path toward developing some other really useful application. Perhaps it is time we updated our thinking of job analysis and regarded the approach as more an ongoing OD intervention than a loosely connected series of tactical projects that happen to occur under the roof of a particular organization. From this perspective, the practice of job analysis is in a position to learn something from the upstart called competency modeling.

Specifically, the field of job analysis might benefit from paying closer attention to the strategic and future-oriented needs of organizations. It is reasonable to conclude that decisions about the strategy and direction of an organization will have downstream implications for work roles and worker requirements. To paraphrase Scheider (1976), work roles, job re-

quirements, and organizations do not exist independently. Yet there is virtually no research and very little description of practice. How might a job analytic researcher go about documenting the ultimate objectives of an organization and translating this information into work requirements for a job or job group? Does the concept of a Strategic Relevance Ratio, somewhat along the lines of Lawshe's (1975) Content Validity Ratio, make sense as a way to measure the distal linkage between job analytic results and the higher order goals of an organization? Opportunities for research and creative practice abound and job analysis practitioners appear to be overlooking a terrific opportunity to consult with, and deliver value to, an organization's senior leadership team.

Next, as noted earlier in the paper, many job analysis approaches are focused on describing the content of a job or identifying what is different between jobs. What seems to be frequently overlooked in job analysis research is to identify what is common across jobs, job groups, occupational groups, business segments, and so forth, in an effort to build platforms of information that can be used to support a broad range of applications in an HR system. In other words, what activities or worker characteristics are core or important organization-wide? Or, for a particular organization, what descriptive content of jobs or workers might be business unit specific (e.g., are some general skills or orientations important in international business segments but not domestic ones?). Is it possible to map out and chart changes in the common requirements associated with jobs across levels (e.g., which activities or worker characteristics are components of all executive jobs vs. midlevel management jobs vs. entry-level supervisor jobs)? Further, how might these broad or general classes of descriptive content be aligned with the very detailed, technical, functional-specific activities, skills, and knowledge descriptions that are required to drive some HR applications?

By posing these questions we do not mean to imply that the folks in the competency modeling camp have got everything figured out. This clearly is not the case. However, in the information-driven organization of today, where dramatic developments in HR software and enterprise-wide resource planning systems (ERP) are reshaping the role of HR (Schippmann, 1999), they appear further down the path than those in the job analysis camp. These ERP systems (from companies like PeopleSoft, SAP, Oracle, Baan, and Lawson, to name just a few) require underlying definitions and architectures of work and worker requirements. In this arena, competency advocates have been quick to try and build models that lay the foundation for integrating multiple HR applications. If the job analysis practitioners are not careful, they may find themselves left out of the picture in what is shaping up to be a huge development in HR management. Rather than redirecting the focus of job analysis prac-

titioners, the suggestion here is an expansion of focus, to place equal emphasis on documenting, analyzing, displaying, and in general thinking about what is core or common across jobs, job levels, functions, and business groups in an effort to support integrated systems of HR applications. In short, the more rigorous job analysis techniques may also be used to define core competencies.

The inclusion of variables such as personality and value orientations into the mix of potentially useful descriptive content is another opportunity for positive change for job analysis; and one that has been noted elsewhere (Guion, 1998; Raymark, Schmit, & Guion, 1997). The goal here would be to identify and measure those characteristics that tap into an individual's willingness to perform certain activities or to "fit in" with the work culture of a particular organization. These are organizationally hot topics today, and many job analysis approaches have been slow to build these perspectives into the descriptive content that characterize the outcome of job analytic research.

The flip side of the above discussion is equally useful, and that is to elaborate on how competency model development can benefit from job analysis methodology. To begin, a common pitfall of many competency modeling efforts appears to be an attempt to overgeneralize from the core competency concept. Not all of the competency items or behaviors that operationally define a competency dimension are equally useful for all jobs, job levels, business segments, or regions throughout the organization. Increased attention on procedures for prioritizing some content, so the resulting models reflect the unique needs of different job groups and areas of the organization, will likely produce results that are more meaningful. In this regard, job analysis methodology offers a wide range of qualitative and more empirical procedures for weighting the content of a descriptor set.

Similarly in contrast to competency modeling, many job analysis efforts include at least some effort to evaluate the consistency or reproduceability of the results. If competency modeling initiatives included some evaluation of the resulting categories in terms of the percentage of behaviors correctly matched to competency category definitions by users of the final system or target application, or examined the average intercorrelations of items within a category, or investigated the agreement between SME raters (which would be possible if there were some method for prioritizing content—see above), it would likely help open doors for using modeling results to support HR decision-making applications such as selection and performance appraisal. By the same token, it would probably also help if there were some increased attention on the part of competency modelers to document their procedures for creating (or selecting) descriptor content (e.g., rules for establishing the qualifi-



cations of content experts, logic behind sampling plans). Although we are not aware of any legal challenges sustained by organizations using competency models to support their HR applications, it can be expected that, as such challenges start to reach the courts, the need for better documentation will become more obvious.

Next, although not wanting to recreate what sometimes seems to be a myopic focus on task statements and technical skills found in job analysis, the competency movement might benefit from efforts to integrate technical or functional competencies into the resulting models. In short, focusing only on broad, general competencies leaves a large portion of what is related to an individual's success in a job unaccounted for. Perhaps a modularized approach is possible, where it is possible to mix and match subsets of general competencies and technical competencies to create more comprehensive descriptions of a target population (which may be defined as broadly or narrowly as need be to serve a particular purpose). For example, perhaps only those subsets of the general competency domain that are "core" should be used to communicate the agreed-upon guiding values and principles of the organization. On the other hand, perhaps a mix of the most important core competencies and technical competencies might be used to develop selection specifications for a particular job or job group.

In addition, in our view, the resulting models or descriptive taxonomies will be most powerful, and have the greatest utility, when the level of detail provided by the approach matches that required for use. However, there are no specific rules to guide practice in this area, for either competency modeling or job analysis, and there should be. In a related vein, the operational models used in organizations need to have the flexibility to allow users to drill down to a level of detail required to support certain applications, and to spiral up to a broader or more generic set of descriptors to drive other applications where the additional detail is unnecessary or a distraction.

Finally, it is the opinion of the members of the task force that no single type of descriptor content (e.g., competencies, KSAOs, work activities, performance standards) is best suited for all purposes. If the plan is to conduct job evaluation research, then a mix of detailed work activity descriptors and moderately detailed KSAO or competency descriptors may be required. On the other hand, if the intent is to create a behaviorally based interview guide for selection purposes, then perhaps a mix of moderately detailed competency descriptors and an associated set of performance standards would be most useful. Similarly, the configuration of content would likely change depending on whether one was creating a 360° developmental feedback tool or engaging in content-oriented test construction, and so on. Up until about 1970, the different

job analytic approaches focused primarily on a single type of information (Prien & Ronan, 1971). However, over the past 30 years, there has been growing recognition of this issue in the job analysis camp, as evidenced by the number of multidomain approaches available (e.g., Drauden & Peterson, 1974; Lopez, Kesselman, & Lopez, 1981; Prien, Goldstein, & Macey, 1987). Conversely, there is little evidence of a similar level of recognition on the part of those working in the competency modeling arena.

In conclusion, there is an old Chinese curse which, when translated, essentially says "May you live in interesting times." Well, the pace of change in business, coupled with the rapid advance of enterprise-wide computing technology and information systems, has made things pretty interesting in the HR field. One of the areas where practice has become really interesting cuts right to the heart of the field and involves how we go about identifying and describing the important work-related aspects of a job and the associated worker requirements. Although none of the SMEs in the interview process made this point, what the future might hold is a blurring of borders as the competency modeling and job analysis approaches evolve over time. Thus, the next generation of approaches in each case may result in a blending of best practices such that there are more similarities than the differences that exist today.

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## APPENDIX

### Interview Protocol

1. How do you define a "competency"? (How is it different from the concept of KSAOs?)
2. What types of human resource applications can competencies and competency modeling support? (Where have you found competencies to be most successfully applied?)

3. What types of human resource applications should competencies and competency modeling not be used to support? (Why not?)
4. How is competency modeling different from job analysis? (What are the basic steps involved in developing a competency model?)
5. Should competency models be validated? (If "no," why not? If "yes," when and how?)
6. Why competencies? What is the attraction/value beyond other ways individual differences might be described and characterized?
7. Where do you see the future of competency modeling headed?
8. Would you provide us with some background information about yourself so we may create a general profile of the people surveyed? (What is your job title? Number of years directly involved in the study or application of competencies? Approximate number of applied competency projects completed?)
9. Do you have some written material, brochures, presentation content, summaries or write-ups of project work, and so forth, related to this topic that you would be willing to share with the task force that could illustrate and elaborate on some of your points?